

# GIS International Forum

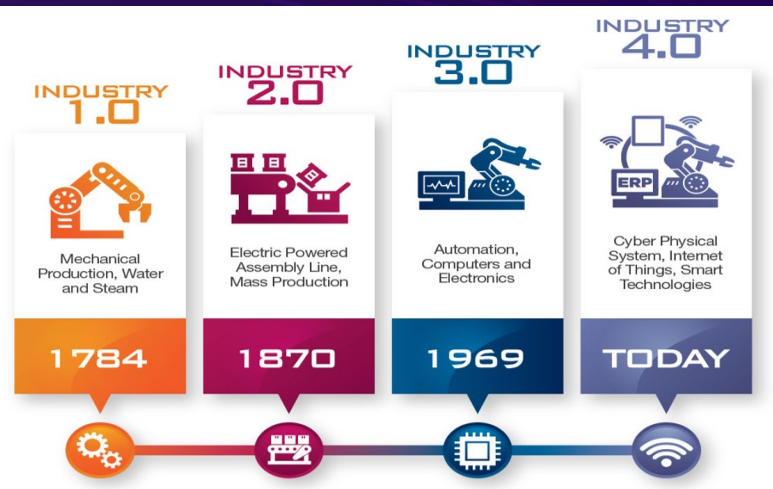
# INFRASTRUCTURE 4.0

GIS, Big Data & Artificial Intelligence for Speed Train Railways Construction Monitoring

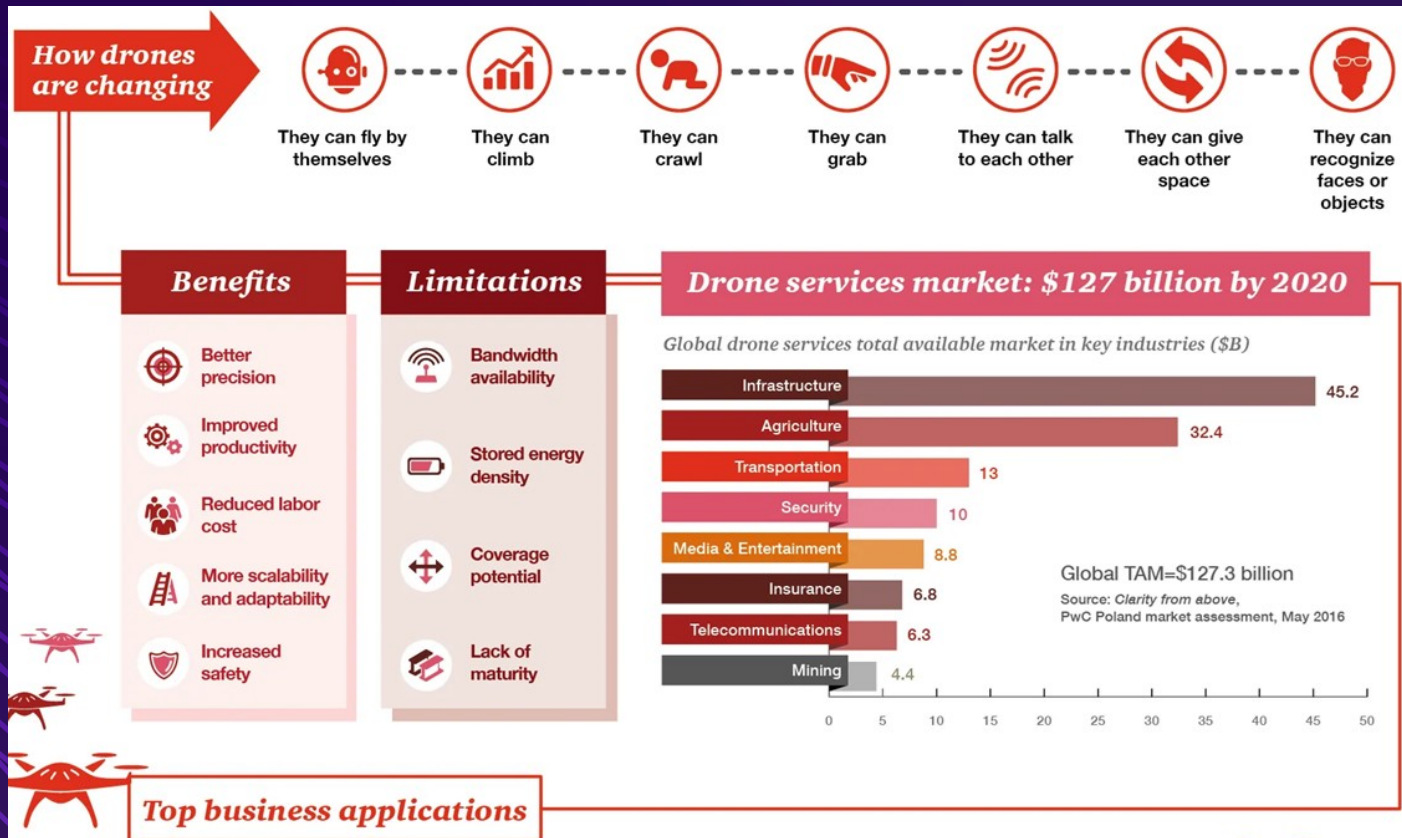
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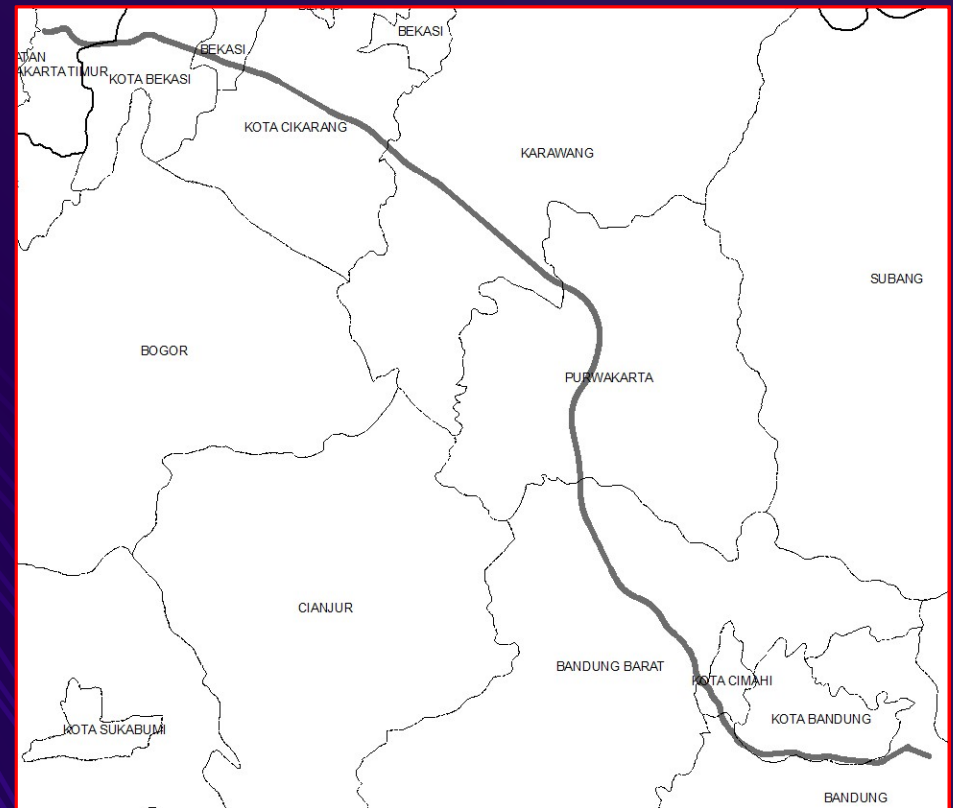
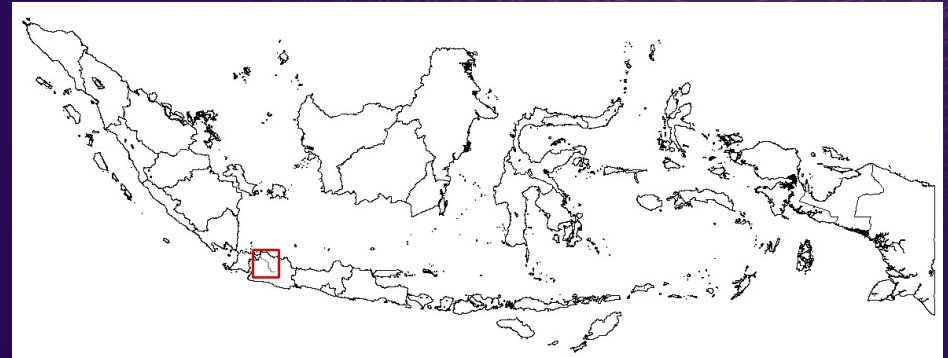
**Drones extend existing aerial photography and sensor data collection methods.** Because drones are short range, they complement other data sources, including satellite imagery, manned aircraft and ground robots. Service providers aggregate these sources, filter, analyze and deliver results to a smartphone or other display.



## INDUSTRIAL REVOLUTION 4.0



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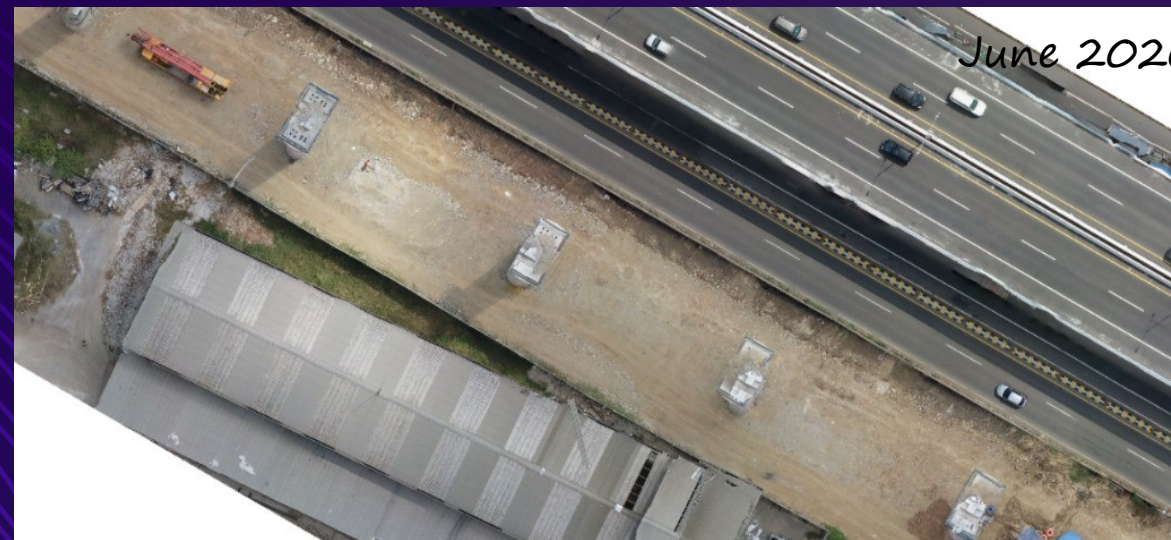
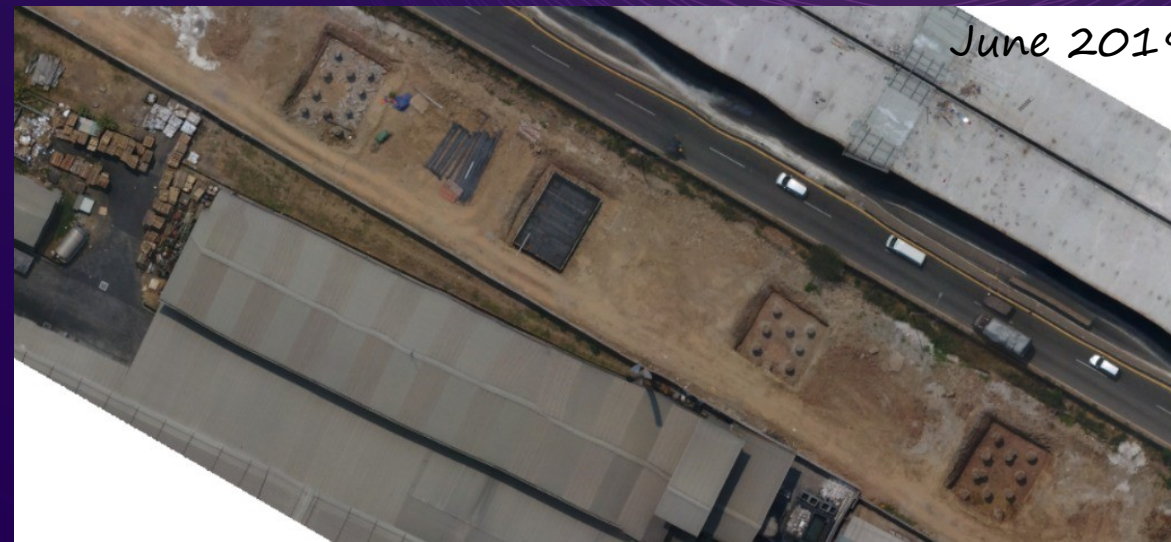
# GTC 2020

GIS Software Technology Conference 2020

## GIS International Forum

GIS-based dashboard containing Data, Information & Knowledge about the project characterized by:

- I. Spatio-Temporality : Progress over time
- II. Precision : High-Resolution Aerial Images [GSD ~ 5 cm]
- III. Accuracy : Location Based





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Zoom Picture + AI Picture + ML Principal

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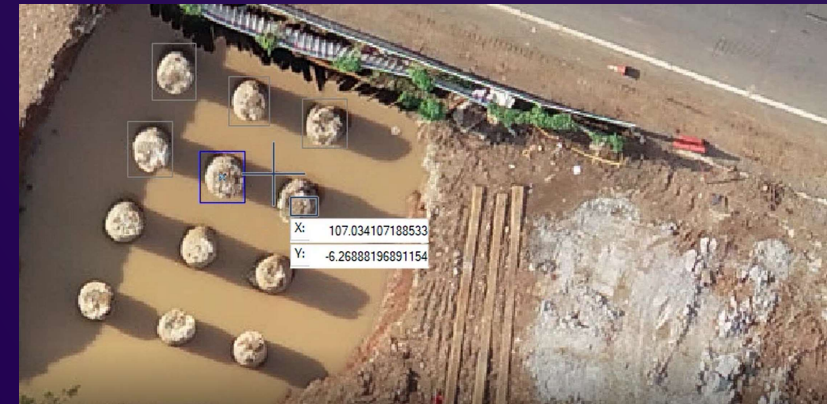
Machine Learning [AI – Algorithm] used to train machine to recognize objects / construction components automatically.

- I. More data ~ more “clever” machine
- II. Efficiency : Once defined, algorithm will count all construction components [object of interest and object of important]
- III. Accuracy : - more data high accuracy

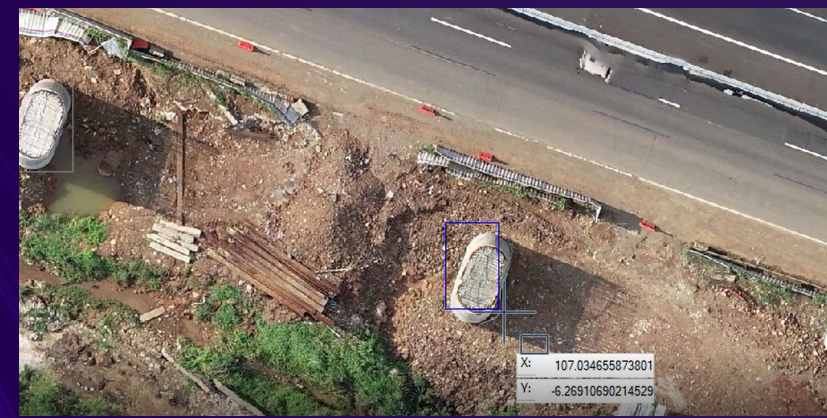
Substructure:  
Piles



Substructure:  
Piles



Superstructure:  
Pile Cap





# GTC 2020

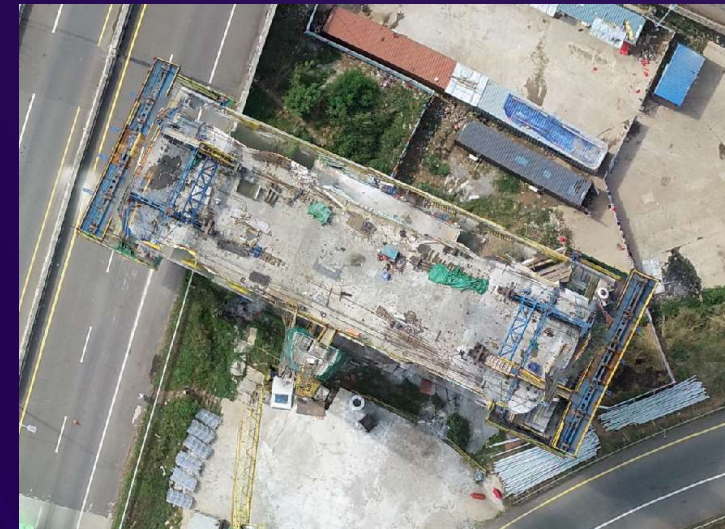
GIS Software Technology Conference 2020

## GIS International Forum

Substructure: Pile Groups



Superstructure:  
Girder





## GIS International Forum

- I. Efficiency
- II. Accuracy & Precision
- III. Spatio-Temporality
- IV. Hardware, Software & Brainware
- V. Reliability
- VI. Towards GIS 4.0

